

EXAMINING THE EFFECTS OF A HEALTHY RESTAURANT INTERVENTION ON
CUSTOMERS' PURCHASES OF HEALTHIER FOOD OPTIONS IN LATINO
FAMILY-OWNED RESTAURANTS

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ABSTRACT

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This study examined the effects of a Healthy Restaurant Intervention on customers' purchases of healthier food options in Latino family-owned restaurants. As part of the context for this study, the Nutrition Committee of the Latino Health for All Coalition collaborated in a community-based participatory research approach to implement a Healthy Restaurant Award Program. The objective of the Healthy Restaurant program was to make healthier food options available and accessible in restaurants in low-income, predominantly Latino neighborhood. The Healthy Restaurant Intervention in this study consisted of placing small menu stickers for identified healthier food options and assuring that healthier food options were available by modifying recipes/servings in the two participating family-owned restaurants. The effects of the intervention were examined with one primary dependent variable: customers' purchases of healthier food options. In addition, to assess the context of healthier food options available to customers, the study also measured modifications made by the restaurant owners in traditional recipes/menu items based on the Dietary Guidelines for Americans, 2010. Results showed that the Healthy Restaurant Intervention produced no discernible improvements in customers' purchasing behaviors in either restaurant. Assessments showed that there were a number of menu modifications made by participating restaurant owners to assure healthier food options on their menus. The findings suggested that the Healthy Restaurant Intervention—consisting of small menu stickers and access to healthier food options—was not effective in increasing purchasing behaviors of customers visiting participating restaurants. Limitations are discussed in addition to strengths and implications for future research and practice.

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Introduction

Obesity continues to rise among adults in the United States (Flegal et al. 2012). Its prevalence among racial and ethnic minority groups is particularly high, including in the Latino population. The Office of Minority Health, US Department of Health and Human Services, reported in 2010 that Hispanics in America were 1.2 times more likely to be obese as compared to the non-Hispanic White population. The report also indicated Hispanic women were 40% more likely to be overweight when compared with non-Hispanic White women.

Obesity is a non-communicable health condition. Behavioral and environmental factors contribute to a higher prevalence of obesity (Harvard School of Public Health, 2013). Obesity related behaviors include lack of healthy eating (e.g., consumption of overall more calories and saturated fats) and low levels of physical activity (Eckel & Krauss, 1998). Environmental factors contributing to obesity include away-from-home food settings and lack of access to full service grocery stores and supermarkets (Harvard School of Public Health, 2013). Obesity leads to health consequences such as risks for cardiovascular diseases, high blood pressure, type II diabetes, stroke, and cancer (Wellman & Friedberg, 2002). Obesity-prevention is thus a very important public health goal and is also mentioned in the objectives of Leading Health Indicators, Healthy People 2020 (U.S. Department of Health and Human Services, 2013).

The 2012 Institute of Medicine (IOM) report on *Accelerating Progress in Obesity Prevention* (APOP) recommends use of multiple environmental change strategies to create conditions fully supportive of healthy eating and physical activity. For the food environment, relevant APOP strategies suggested in the IOM report include: 1) Increase the availability of lower-calorie and healthier food options in restaurants and 2) Create food environments that ensure that healthy food options are the routine, easy choices.

Prior research has examined the effects of one of the APOP strategy—ensuring that healthy food choices are the routine, easy choices—to promote healthy food purchases. Papies & Veling (2012) conducted an experimental study to test the effects of subtle diet-related reminders on the choices of customers for lower-calorie food in café-style restaurant in Netherlands. The study was conducted during evening meal hours in three subsequent weeks and the intervention included dinner menus on each table accompanied by an attached sheet with cook-recommended offers. The study used two conditions, a control condition in which participants were presented with “special offer” words on their menu and a diet-reminders condition in which subtle diet reminders such as “low-calorie” “calorie-conscious” and “Are you watching your weight?” were added on the menus. Based on an informed survey with participants, the researchers also classified customers into three diet-status conditions (i.e., current dieters, chronic dieters and non-dieters). The authors compared two conditions (control condition with experimental condition) with three diet statuses (i.e., current dieters, chronic dieters, and non-dieters) of the customers. The results showed that in control condition there were no changes in purchases of lower-calorie food by customers in any of the diet-status condition ($p = 0.96$); however, in the diet reminder condition, chronic as well as current dieters made more healthy choices than non-dieters ($p = 0.01$, OR= 15.8). The findings suggest that diet reminders encourage purchases of low-calorie food items in customers for whom dieting was a goal.

Mayer et al. (1986) evaluated the effects of a cafeteria-based low-cost intervention on customers’ rates of purchases of low-fat entrées by placing a colorful poster that listed benefits of low-fat entrées, daily offerings of low-fat entrées, and small table fliers for each of the tables in a public cafeteria. This study lasted nine weeks, included 24 observation sessions (observation sessions were conducted during prime dinner hours and were distributed equally in all the phases

of the study) and was conducted in four consecutive phases in A-B-A-B design. The results showed significant increases in purchase rates of lower-fat entrées from initial baseline to first time implementation of the intervention (χ^2 [n=1,410] = 47.82, $p < 0.001$) but comparatively smaller increases at the time of re-introduction of the intervention (χ^2 [n=1,356] = 8.73, $p < 0.005$). The findings suggest that a low-cost intervention containing both, nutritional information and listing of low-fat entrées, implemented in food environments could encourage purchases of healthier food options.

Fitzgerald et al. (2004) used an A-B design to examine the effects of an eight week promotional campaign on the sales of Heart-Healthy main dish menu items. The intervention for promoting heart-healthy menu items consisted of professionally developed advertisements placed in periodic print publications and posters and table tents placed in nine local community restaurants. The posters were positioned at different locations inside the restaurants such as on tables, in entryway, at the cashier's counter and in the restrooms. They were also placed in the waiting room of a community clinic. The study included four weeks before the intervention campaign, eight weeks during the promotional intervention campaign, and four weeks for post-intervention campaign period. Participation criteria for the restaurants required an electronic receipt counter. The results showed that four of the nine restaurants had a slight increase or no decrease (change ranging from 0% to 21% increase) and the remaining five restaurants showed a decrease (change ranging from -9% to -2%) in the sales of heart-healthy menu items. These results showed overall, there was a trend toward a small increase (28% to 33%) after the eight weeks campaign in the sales of heart healthy menus but they were not statistically significant. The findings suggested that prompting interventions might have limited effects on purchases of targeted entrées. The authors also reported that to achieve larger effects of such interventions it

might be required to continually use environmentally-based, multiple component interventions in restaurants which might elevate the cost of the intervention considerably. The authors suggest, future studies should conduct focus groups, interviews or surveys with participating restaurant owners to learn their perspective about effective strategies to improve purchases by customers.

Studies have also examined effects of simpler approaches such as placing symbols indicating targeted entrées on customers' purchases. Freedman & Connors (2010) used a quasi-experimental design—A-B design—to examine the effects of point of purchase prompts on the purchasing habits of college students at a convenience store located on a university campus. The intervention included tagged items on the store shelves as point of purchase prompts. This study collected data for six weeks during the baseline and for five weeks during the intervention phase. The results showed that there were overall increases (3.6%) in percentage of purchases of some of the food items such as cereal, soup, and crackers and decreases in other item such as bread (-1.7%) ; however, none of the changes were statistically significant ($p = 0.082$). The findings suggest that providing point-of- purchase nutrition information alone may have limited effectiveness. In terms of limitations, the authors reported that it was a short duration study; there was limited access to sales data for the researchers, and when tagged items in the store were sold out there was decreased availability for purchase.

Levin (1996) conducted a pilot study that used symbols to promote existing menu items in a workplace cafeteria. This study used a repeated measures, comparison group, quasi-experimental design to see the effects of an intervention consisting of a poster placed at the cafeteria entrance and small heart shaped labels placed next to three lower-fat entrees: bean burritos; potato and chili burritos; and a turkey, lettuce, and tomato sandwich. Lunchtime observations were recorded during this study. The observation #1 was used as the baseline which

lasted for two weeks. The observations #2 and #3 were conducted during the intervention phase each of which lasted for two weeks. The intervention was retained at the experimental cafeteria, and the observation #4 was then conducted 7 months after the observation #3. The results showed that the sales of targeted items increased significantly ($\chi^2 = 40.43, p < 0.001$) during the intervention phase when compared to the baseline sales. However, within the intervention phase, the sales were not significantly different in observation #3 when compared with observation #2 ($p = 0.11$). It was also seen that the sales during observation #4, i.e., seven months later were significantly greater ($\chi^2 = 7.23, p < 0.01$) when compared with overall intervention phase (i.e., combined sales of observation #2 and #3). These findings suggest that a simple point-of-purchase intervention may increase the sales of targeted low-fat entrées and the results may be sustained over a period of 7 months. However, the author reported that some of the increases in sales could be attributed to the interactions of customers among themselves and with the researcher about purchasing targeted entrées. Also, the study did not use any specified selection criteria to target low-fat entrées on the menu. For future studies, it was suggested that specific criteria should be established to target entrées.

Collectively, these studies suggest that prompts—including nutritional information on posters, diet reminders, point-of-purchase prompts, and symbols—were a commonly used approach to make healthy food choices the routine, easy choices in environments such as restaurants. Additionally, these studies also suggest that the effects of prompts may be limited; and may be affected by the importance of diet to the customers, interactions of customers among themselves, and availability of targeted healthy options in restaurants and other food related environments.

Consistent with these findings, other research studies addressing the effects of a second APOP strategy; i.e., increasing the availability of healthier food options was also examined. For instance, Economos et al. (2009) conducted a case study for testing feasibility of a community-based restaurant initiative to increase availability of healthy menu options in Somerville, Massachusetts. The researchers conducted a two year study to recruit, monitor, and examine the ability of a restaurant to comply with criteria established for this community-based initiative. They conducted informal interviews with participating restaurant owners by making unscheduled site visits to monitor their compliance and assess their willingness to make healthier food options available on the menu. The results showed that 28% of targeted restaurants participated in the initiative and one-half of those restaurants fully complied with the established criteria. One of the factors related to their unwillingness to make healthy food options available on their menu was that most of the participating restaurant owners expressed concern about related costs. Also, lacks of time and interest as well as concern for potential losses of profit by the restaurant owners were barriers to their participation in the study. However, the authors also learned from restaurant owners that publicizing their restaurants could facilitate their participation in the program. The findings suggested that community partnerships may be able to induce restaurants to improve access to healthier food options.

Haapala et al. (2011) reviewed a total of 13 studies (i.e., 6 studies in restaurants and 7 studies in schools and for ready-to-eat meals settings) examining how away-from-home meal services could be planned, implemented or evaluated for improving the quality of food. The results from six individual studies from restaurant settings suggested that modifying healthy eating options in restaurants may pose problems such as fear of losing their customers due to removal of or modifying a popular item, and loss of investments due to time-consuming training

requirements for their staff. Restaurant owners expressed their willingness to participate in the initiatives but requested supportive health promotion campaigns for better effects. The findings suggest that cross-sectional studies conducted within restaurant settings could not determine if offering healthier food options could change people's behavior and that guidelines and nutritional recommendations were not always met in restaurants.

Consistent with this strategy of assuring access to healthier foods in restaurants, one more study by Lewis et al. (2005) examined the availability of food options to the African-American populations in low-income targeted areas. The researcher developed an instrument including 21 main questions and 62 total questions. The assessments were conducted with a total of 659 restaurants including 348 restaurants in the target area (low-income neighborhoods with highest proportion of African-American residents) and 311 restaurants in the comparison area (neighborhoods with fewer numbers of African-American residents). Target areas were assessed by community members and comparison areas were assessed by students. The results showed that restaurants in the comparison area offered more options of healthy eating than those in the target area. Particularly, 38.8% restaurants in comparison area offered five or more healthy preparation options whereas only 27% restaurants in the target area offered similar options to their consumers ($p < 0.001$). Similarly, 41% restaurants in the comparison area offered five or more healthier choice options to their customers as compared to 36% restaurants in the targeted area ($p < 0.001$). Also, nine percent of the restaurants in comparison area labeled menus to indicate availability of healthy food options as compared to 6.5% restaurants in the target area ($p < 0.05$). Similarly, nutritional information was available in 5.3% restaurants in comparison area and in 3.1% restaurants in the target area ($p < 0.05$). The findings suggest that food environments in targeted area (such as poorer neighborhoods for African-Americans) offer limited healthy

choices of preparations and food options in restaurants. Also, this study offered an example of a community-based participatory approach; that is, community members and coalition partners were actively engaged in conducting assessments in the target areas in the study. This study stated some limitations such as the study was conducted over a long period of time (total two years), the assessments in comparison area were conducted after the assessments in target area leading to possible biased observations, and there were no inter-observer agreements for observations by community members.

Hanni et al. (2009) conducted an intervention with a Mexican-American taqueria that used nutrition counseling as one of the components of the intervention. During nutrition counseling, a list of healthy food preparation suggestions was provided in the form of a nutrition tool-kit that was introduced to the taqueria owners as criteria to make menu modifications. After multiple visits and conversations between researchers and the restaurant owners, the program was successfully implemented. The results were gathered from responses from 16 taqueria owners. The results showed that 94% of the respondent participating restaurant owners agreed to distribute health education materials. Of those who started promoting overall healthier food options on their menu, 88% owners modified existing entrées or created new healthier food options by following the suggestions in the nutrition toolkit, and 81% promoted healthier food options in side-dish menu items. The findings suggest that taqueria owners may be willing to promote healthy food options on their menu when provided with nutrition counseling about healthy food preparations.

Taken together, these studies show small to modest effects of prompts and assuring access to healthier food options on customer purchases of healthier food options in restaurants.

The purpose of the present study was to test the effects of a low-cost intervention on choices of healthier-food options in Latino family-owned restaurants in a low-income neighborhood. The study examined the effects of a Healthy Restaurant Intervention that consisted of small menu stickers placed near or in front of the designated healthier food options and access to healthier food options. As part of the study, to assess availability of healthier food options, the total numbers of modifications reported by the restaurant owners in their traditional or original recipes were also recorded.

Method

Context

This study was a part of the collaboration between the KU Work Group for Community Health and Development at the University of Kansas and a community coalition, the Latino Health for All Coalition (LHFA Coalition, www.kclatinohealth.org) in Kansas City, KS (Fawcett et al. in press). The mission of LHFA Coalition was to reduce diabetes and cardiovascular diseases among Latinos in Kansas City and Wyandotte County through a collaborative partnership to promote healthy nutrition, physical activity and access to health services. The LHFA Coalition included a structure of a Community Action Board (CAB) which oversaw the functioning of three action Committees including those related to the goal areas of: Nutrition, Physical Activity, and Access to Health Care. The KU Work Group's role in this collaboration was to be a scientific partner and support participatory research to help the coalition see progress and reach its goals by implementing environmental changes to promote healthier behaviors.

As a part of the collaboration, the Nutrition Committee of the LHFA Coalition, including the researcher, volunteered to make healthier food options available and accessible to the community; especially in the targeted zip code of 66101. One of the objectives of the Nutrition Committee was to implement "A Healthy Restaurant Award" to honor restaurants that make

healthier food options available and accessible to community members. In establishing criteria (Appendix A) for Healthy Restaurant Award eligibility, Latino community members provided input to the Nutrition Committee consistent with a Community-Based Participatory Research (CBPR) approach. According to the Healthy Restaurant Award criteria, any restaurant in the zip code 66101 offering a minimum of six of the 12 identified criteria was eligible to receive the Award. The Healthy Restaurant Award consisted of large stickers placed on the door of the restaurant to designate that they offered healthier food options. The present Healthy Restaurant Intervention study was an enhanced version of the Healthy Restaurant Award program; it used small, symbolic stickers to place in front of identified healthier food options on the awardee restaurants' menus.

Participants and Setting

The Healthy Restaurant Intervention study was conducted with two Latino family-owned restaurants in the zip code 66101 in Kansas City, KS. Participating restaurants were required to meet all of the following inclusion criteria for this study: a) Be a recipient of the HR Award granted by the LHFA Coalition Nutrition Committee; b) Serve traditional Latino food such as tacos, burritos, and enchiladas; c) Be a Latino family-owned restaurant; d) Be located in zip code 66101; and e) Have a categorized electronic receipt counter in addition to handbills to enable measurement of customer food purchases.

Two owners of Latino family-owned restaurants that met the above criteria for the intervention study agreed to participate in the study. Participating owners signed an informed consent approved by KU's Institutional Review Board (HSCL approval #19743). They shared their restaurant receipts with the researcher for some weeks before and during the intervention. This enabled the researcher to observe customers' purchasing behavior through indirect

observations. Before the study, preliminary observations confirmed that both settings were full-service table restaurants; that is, customers paid after the order was placed. The restaurants were open for the same working days, Monday through Saturday. A preliminary review of receipts during this pilot phase suggested that both restaurants had more customers over the lunch hours and a similar volume of customers each day.

Measurement of primary dependent variable--Customers' purchases of healthier food options

The researchers in the study, including the nutritionist in the LHFA Nutrition Committee, established categories of criteria and specific examples for healthier food options that were based on the Dietary Guidelines for Americans, 2010 (Appendix B). A Healthier Food Option was defined as an existing menu item identified by the participating restaurant owners that met the categories of the criteria and specific examples provided to the restaurant owners. For example, a healthier food option was identified when it met any one of the categories: a) reduced portions of solid fats (i.e., lard or butter); b) replaced with lower fats such as olive oil, served with no or lower-fat cheese or sour cream; c) reduced calories in a menu item (e.g., replaced meat with fish/seafood, substituted chicken for pork or beef, used a smaller portion size as compared to other items on the menu); d) reduced sugar (e.g., no or less added sugar); e) reduced refined grains (e.g., reduced portions of refined grains, replaced refined grains with whole grains such as flour tortillas with wheat tortillas, white rice with brown rice); f) prepared or served with fresh veggies, and g) reduced sodium (e.g., no or less added salt) (The Dietary Guidelines for Americans, 2010).

Data collection occurred during the day-time period negotiated with the restaurant owners; that is, all customer receipts for the lunch hour for one day per week. The lunch hour

was selected for data collection since there was a higher volume of customers during this time period. Specifically, it included three hours of lunch service, plus an additional hour to capture those customers who placed their orders near to the end of the lunch hour. This was 11:00 a.m. – 3:00 p.m. for Restaurant #1 and 12:00 p.m. – 4:00 p.m. for Restaurant #2. Data receipts were collected once a week on the same day for each restaurant throughout the study; i.e., on Mondays for Restaurant #1 and Wednesdays for Restaurant #2. (Data, in the form of receipts, were sometimes collected on an alternate weekday to accommodate the availability of the owner). Pilot observations indicated that these days and times were typically the busiest hours for the respective restaurants. The researcher (first author) took photos of all the electronic receipts and corresponding handbills for the each lunch-hour observation session to enable scoring at a later time.

The electronic receipts and corresponding handbills were used to record indirect observation of customers' purchases of healthier food options. Electronic receipts for the data during the study period (May to September) confirmed the date and time of orders on written handbills. Corresponding handbills for each receipt were used to identify the specific types of healthier food options purchased. To assess healthier food purchases, the observer 1 (first author) coded and scored the presence or absence of healthier food options by reviewing the electronic receipts and handbills. For recording purposes, a measurement tool (See Appendix C, Scoring Sheet: Observing Presence of Healthier Food Options) was created and used throughout the study to record the number and percentages of healthier food options purchased.

To assess the reliability of the data, observations were secondarily scored by an independent observer. Observer 1 (first author) used the codebook and definitions to score choices of healthier food options based on restaurant receipts. Observer 2 was trained to

secondarily score observations and record them using the same measurement approach (Appendix C). Observer 2 was provided with the codebook of behavioral definitions and criteria for scoring the presence or absence of healthier food options from a provided sample of receipts. This codebook included examples of healthier food choices; for instance, Chicken Taco (Taco Pollo) or Fish Taco (Taco Pescado) – as well as non-examples (e.g., beef burritos, all enchiladas, etc.). Opportunities to practice coding and feedback from the first author were also provided to the secondary observer.

Inter-observer agreement was assessed among the two observers scoring the presence or absence of customers' choices of healthier food options from the provided sample of electronic receipts and corresponding handbills. Agreements were counted when both the observers scored the presence or absence of a healthier food option. For instance, agreement was scored when both observers scored the choice of fish tacos as a healthier food option. Reliability of observations was calculated by dividing the number of agreements by a sum of the total number of agreements and disagreements multiplied by 100. Inter-observer agreement on the scoring of food choices as healthier food options was 99%.

Assessment of menu modifications to create healthier food options

To assess the availability of healthier food options—an aspect of the intervention—menu modifications in food options were self-reported by participating restaurant owners. For this, the researcher documented all those modifications made by the participating restaurant owners in their original or traditional preparations or servings. The researcher asked structured questions to restaurant owners to identify an existing menu item for which the restaurant owners had made changes or modifications in their original or traditional preparations or servings. These reflected modifications made in a time period extending before the start of the study until the time of their

reporting to the structured questions by the researcher. The structured questions included categories of criteria and their specific examples that were based on the Dietary Guidelines for Americans, 2010 (Appendix D). For example, a healthier food option was identified when an existing menu item was modified from their original preparation or serving for : reduced portion sizes and/or reduced sugar content and/or reduced salt content from the original preparation or servings to create a healthier form of the food item. The nutritionist from the LHFA Coalition helped with assessing whether reported changes constituted a healthier option according to the Dietary Guidelines. Healthier food options thus identified by the restaurant owners and approved by the nutritionist were designated as a healthier food option on the menu; these items received a small menu sticker to be placed near or in front of it on the restaurant menu. To systematically record the modifications reported by the restaurant owners, the researcher then counted number of modifications in each of the criteria categories (Appendix B).

Social validity assessments

Social validity assessments were conducted with participating restaurant owners to assess the appropriateness of intervention procedures. The questionnaire (Appendix D) shared by the researcher (first author) included these questions: a) How easy was it to identify the healthier options on the menu? b) How well did the Healthy Restaurant Program fit your restaurant and the Latino community it serves? c) How willing are you to recommend the Healthy Restaurant Program to other restaurant owners? d) Overall, how satisfied are you with the Healthy Restaurant Program? e) Other comments. Responses to this questionnaire were categorized in a Likert-type scale format from 1-5 (1=not at all and 5= very much).

Healthy Restaurant Intervention

The Healthy Restaurant Intervention consisted of placing small menu stickers for identified healthier food options and assuring that healthier food options were available by owners modifying recipes/servings. These components were consistent with the Institute of Medicine report on Accelerating Progress in Obesity Prevention (APOP) (IOM, 2012). For instance, the Healthy Restaurant Intervention's sticker placing and access to options reflected the APOP recommended strategy of creating food environments that ensure that healthy food options are the routine, easy choices.

Table 1 displays the intervention components, more specific elements used in the Healthy Restaurant Intervention, and the related APOP strategies. The first intervention component – providing information at the point of decision making – included the specific element of placing small menu stickers near or in front of the menu options (served as visual prompts for the customers at the point of decision making). These were related to the first APOP strategy—creating food environments that ensure that healthy food options are the routine, easy choices. The second intervention component of assuring access to healthier food options included the element of availability of healthier food options by the participating Latino family-owned restaurants. Specifically, the restaurant owners identified and designated healthier food options (by reviewing existing menu items and by making feasible changes in additional menu items) based on the categories of criteria established from the Dietary Guidelines for Americans, 2010. At the end of the third week in the study, all the healthier food options were reported during an informal interview with the researcher by the restaurant owners. The candidate healthier food options were then reviewed and approved by the nutritionist in LHFA Coalition which assessed whether reported changes constituted a healthier option according to the Dietary Guidelines. The

identified and approved food options were then designated on the menu and made fully available to the customers once the intervention was in place in the participating restaurants i.e., from week 9 in Restaurant #1 and from week 13 in Restaurant #2. These were related to the second APOP strategy of increasing the availability of lower-calorie and healthier food options in restaurants.

Table 1: Healthy Restaurant Intervention components, specific elements, and related APOP strategies (from IOM report for Accelerating Progress in Obesity Prevention, 2012).

Intervention Component: Behavior Change Strategy	Specific Elements of the Intervention	Related APOP Strategy
Providing Information at Point of Decision Making	a) Placed smaller symbolic stickers on menu near or in front of identified healthier food options	Create food environments that ensure that healthy food options are the routine, easy choices.
Assuring Access to Healthier Food Options	b) Availability of Healthier Food Options through identification and designation of healthier food options based on criteria established from the Dietary Guidelines for Americans, 2010.	Increase the availability of lower-calorie and healthier food options in restaurants.

The elements of the Healthy Restaurant Intervention were developed and strategies were tailored to the cultural context of Latino family-owned restaurants. First, the Latino community members helped to translate the messages on smaller stickers into Spanish. Second, community members provided examples of culturally used saturated fats and other ingredients as specific examples for the criteria of categories that were based on the Dietary Guidelines for Americans, 2010 for the context of Latino family-owned restaurants (e.g., menu items modified by using oil instead of solid fat such as lard).

Study Design

This study used a multiple baseline design across participating restaurants to examine the effects of Healthy Restaurant Intervention on customer's purchase behavior. During baseline, before stickers were placed on the restaurant menu, receipts were collected for eight weeks for Restaurant #1 and for 12 weeks for Restaurant #2. The intervention was in place in the ninth week in Restaurant #1 and by the 13th week in Restaurant #2. Receipts during intervention phase were collected up to the 17th and 18th weeks from Restaurant #1 and Restaurant #2 respectively.

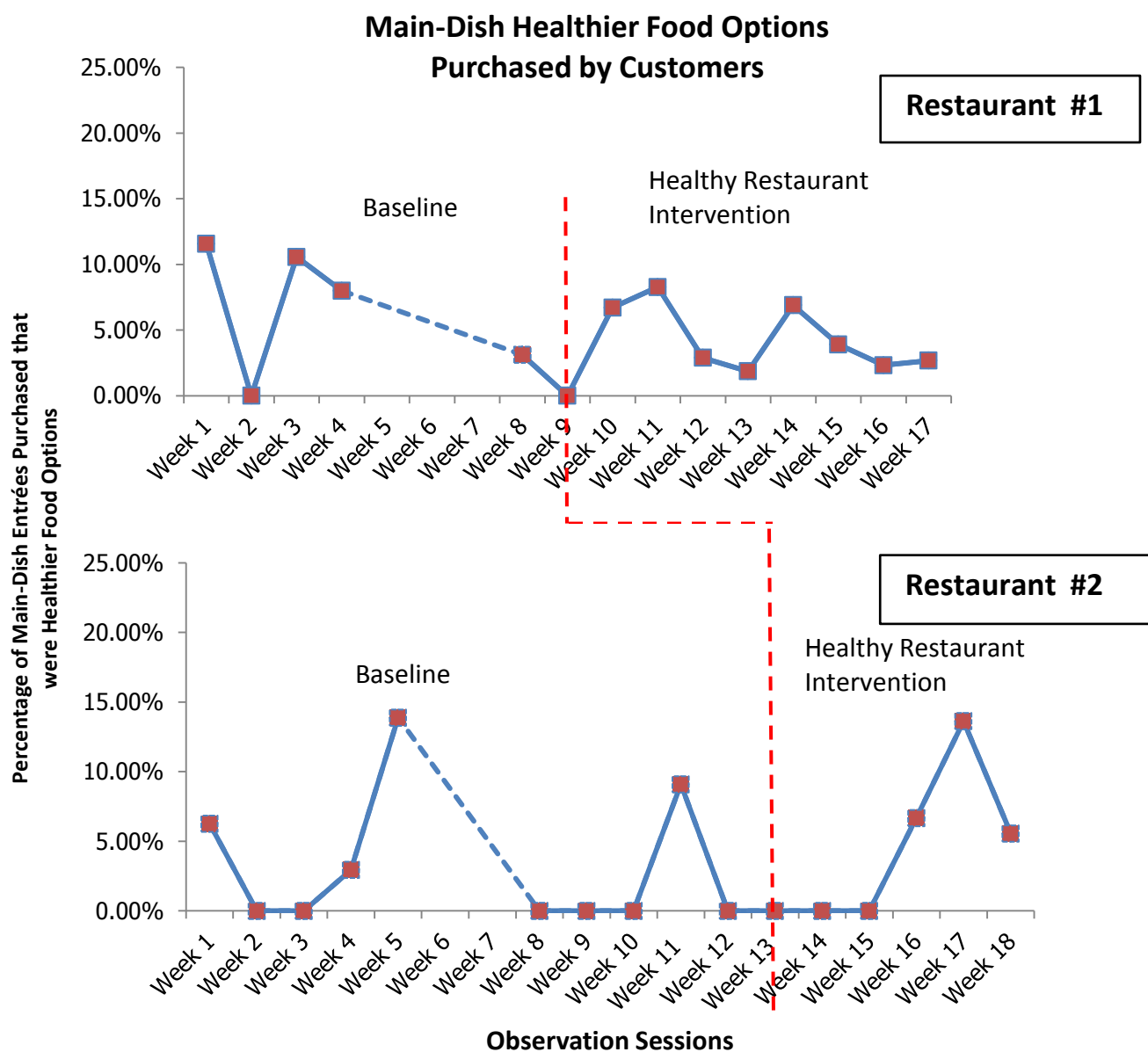
Additionally, to assess the context of healthier food options available to customers, the study also measured modifications made by the restaurant owners in traditional recipes/menu items based on the Dietary Guidelines for Americans, 2010. The researcher systematically recorded how many and what kinds of modifications had been made by the restaurant owners in their original or traditional recipes or servings.

Results

The current study addressed the primary research question: *What were the effects of the Healthy Restaurant Intervention on the purchasing behaviors of customers in participating restaurants?* To answer this question, the study collected data on customers' purchases of Healthier Food Options. To assess availability of healthier food options, the researcher collected data on number of modifications made by the restaurant owners in their original/traditional recipe to create a healthier food options.

Figure 1 depicts the percentage of healthier food options for Main Dish purchases in Restaurant #1 and Restaurant #2 for each weekly observation period during both conditions of the study. Each data point in the graph displays one observation period (i.e., one day) of that week.

Figure 1: The Percentage of Main-Dish Entrées purchased those were healthier food options in participating restaurants.



For Restaurant #1, a mean percentage of 6.65% of the Main-Dish entrées purchased that were healthier food options (39.9 out of 600 total items purchased) were selected during the baseline; this decreased to a mean of 3.95% (47 out of 1193 total items purchased) during the

intervention phase. During baseline, the weekly percentage of entrées purchased that were healthier food options was relatively low; there was a moderate amount of variability (ranging from 0% to 11.57%) in the weekly purchases during the baseline condition. During the Healthy Restaurant Intervention phase, the weekly percentage of purchases remained relatively low (i.e., less than 5%). For Restaurant #2, the mean percentage of Main-Dish entrées purchased that were healthier food options, during the baseline were 3.22% (4 out of 140 total items purchased). This remained virtually the same, at 4.31% of purchases, during the intervention phase (10 out of 236 total items purchased). Specifically, during the baseline, the weekly percentage of entrées purchased those were healthier food options showed variability (ranging from 0% to 13.88%). During the Healthy Restaurant Intervention phase, initially there was no change in weekly percentage of purchases and then there was a short increase in percentage of purchases between weeks 15 and 17 followed by a decrease from week 17 to week 18 and overall, they remained low. The weekly percentage of entrées purchased that were healthier food options showed moderate variability (ranging from 0% to 13.63%) during the intervention phase. In both the participating restaurants, there were no overall improvements in the purchasing behaviors of customers. Data were unavailable for Restaurant #1 for 5th, 6th and 7th weeks and for Restaurant #2, for 6th and 7th weeks of the study. Factors in missing data were delays in preparing stickers needed for the intervention and requests from restaurant owners not to share additional receipts until close to the intervention phase.

The study also examined customers' purchasing behaviors for individual healthier food options. By assessing this aspect, the researcher was interested in examining which particular healthier food option showed changes in purchases during each condition of the study.

Figure 2: The mean percentage of purchases of individual healthier food options by customers visiting Restaurant #1.

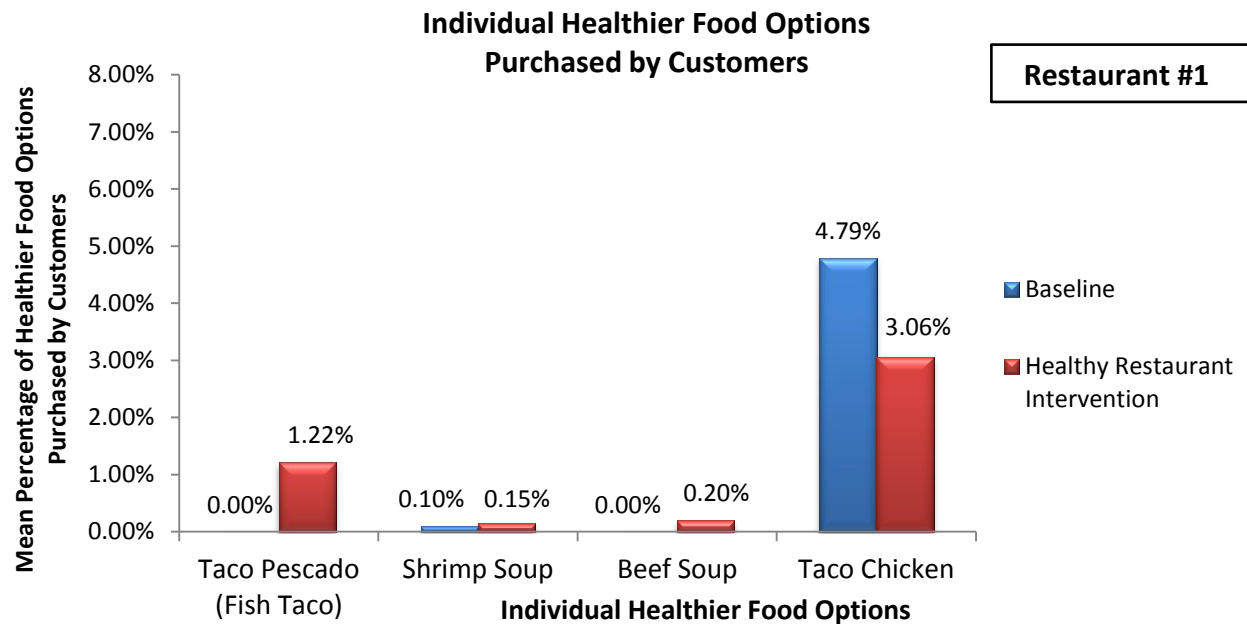
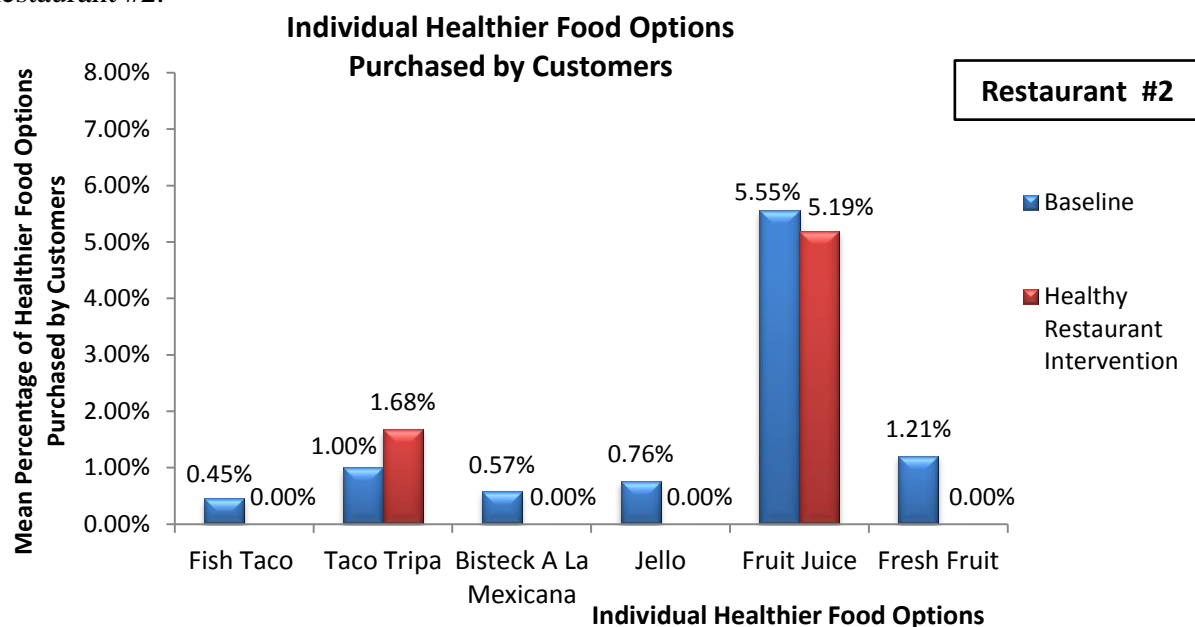


Figure 2 shows that in Restaurant #1 there were no increases in the mean percentage of purchases for all individual healthier food options from the baseline to the Healthy Restaurant Intervention phase. The mean percentage of purchases for Taco Pescado (Fish Taco) before the intervention was 0% and during the intervention phase it was 1.22%. Similarly, there were no changes in the mean percentage of purchases for Shrimp soup during the baseline (0.10%) and during the intervention phase (0.15%); and also for Beef soup, they did not change from the baseline (0%) to the intervention phase (0.20%). The mean percentage of purchases of Chicken Taco (Taco Pollo) during the baseline was 4.79% and during the intervention phase, it decreased to 3.06%. There were no changes in purchasing behaviors of customers after the implementation of intervention within and across individual healthier options.

Data were also collected to examine purchasing behaviors for individual healthier food options in Restaurant #2 during each of the conditions of the study. Figure 3 presents the mean percentage of individual healthier food options in Restaurant #2 in each of the conditions.

Figure 3: The mean percentage of purchases of individual healthier food options by customers in Restaurant #2.



As shown in Figure 3, the results show purchases for each of the individual healthier food options remained virtually the same during the baseline and the Healthy Restaurant Intervention phase. For Fish taco, the mean percentage of purchases during the baseline (0.45%) showed no changes during the intervention phase to (0%). Similarly, the mean percentage of purchases for Taco Tripa did not change from baseline (1.00%) to the intervention phase (1.68%). Also, for Bisteck A La Mexicana, the mean percentage of purchases was unchanged from the baseline (0.57%) to the intervention phase (0%). Similarly, the mean percentage of purchases for Jello-O, fruit juice and fresh fruit remain unchanged from the baseline to the intervention phase. Overall, the purchases of individual healthier food options at Restaurant #2 did not improve during the Healthy Restaurant Intervention phase.

Results from assessment of menu modifications to create healthier food options

To assess menu modifications by the participating restaurant owners, data were collected on how many menu changes were reported in each of the criteria of categories that were based on the Dietary Guidelines for Americans, 2010. This assessment provides number of modifications reported to make healthier forms of the original or traditional preparations or servings. For example, Chicken Taco in Restaurant #1 used a smaller portion size tortilla, leaner kind of meat (i.e., chicken) and was served with no cheese as a healthier food option at the time of reporting to the researcher (a total of 3 modifications made by the restaurant owner). Table 2 presents a total number of modifications made by each of the participating restaurant owners in each of the categories of criteria.

Table 2: Healthier food modifications made by the participating restaurant owners in their traditional recipes.

Categories of Criteria	Number of menu modifications reported by Restaurant #1 N=28	Number of menu modifications reported by Restaurant #2 N=18
1.Reduced portions of solid fats	6	7
2.Prepared or served with fresh veggies	6	4
3.Replaced with lower fats (e.g., oils)	5	2
4. Replaced meat with fish or seafood	5	1
5.Served with no cheese or fats	3	1
6. Reduced to a smaller portion size	2	1
7.Substituted chicken for pork or beef	1	1
8.Reduced added sugar	0	1
9. Reduced portions of refined grains	0	0
10.Replaced with whole grains	0	0
11.Reduced added salt	0	0

Table 2 presents data on the number of modifications reported to create healthier food options to meet the categories in criteria those were based on the Dietary Guidelines for Americans, 2010. For Restaurant #1, a total of 28 modifications were made in nine different menu items. For Restaurant #2, a total of 18 modifications were made in nine different menu items. This represented an average of 2-3 modifications per menu item.

For Restaurant #1, more of the healthier menu changes were made with: a) reduced portions of solid fat (n=6), b) prepared or served with Fresh veggies (n=6), c) replaced with

lower fats (n=5), d) replaced meat with Fish/seafood (n=5), and e) served with no cheese or fats (n=3). Fewer changes were made to: a) reduced to a smaller portion size (n=2), b) substituted chicken for pork or beef (n=1), c) reduced added sugar (n=0), d) reduced portions of refined grains (n=0), e) replaced with whole grains (n=0), and f) reduced added salt (n=0). For Restaurant #2, more changes were made to the categories: a) reduced portions of solid fat (n=7), and b) Replaced with lower fats (n=4). Fewer changes were made to: a) prepared or served with fresh veggies (n=2), b) replaced meat with Fish/seafood (n=1), c) served with no cheese or fats (n=1), d) reduced to a smaller portion size (n=1), e) substituted chicken for pork or beef (n=1), f) reduced added sugar (n=1), g) reduced portions of refined grains (n=0), h) replaced with whole grains (n=0), and i) reduced added salt (n=0).

Social validity data

A social validity assessment was conducted with one of the participating restaurant owners. (Data were not available for the second owner due to unavailability of the restaurant owner). The results showed that the owner reported it was easy to identify healthier food options on the menu (4 rating on 5 point scale) and the healthy restaurant program fit well with the business context (4 rating). The owner was very willing to recommend this program to other restaurants (5 rating). Overall, the owner was satisfied with the Healthy Restaurant Award Program (4 rating on a 5-point scale). The owner also commented that it was easier for customers to see healthier food options were present on the menu and that the smaller stickers were very helpful.

Discussion

The study examined the effects of a Healthy Restaurant Intervention on the purchasing behaviors of customers visiting Latino family-owned restaurants. The results showed that overall

there were no improvements in the purchasing behaviors of customers visiting participating restaurants after the implementation of the Healthy Restaurant Intervention. The findings suggest that the Healthy Restaurant Intervention—consisting of menu stickers and access to healthier food options—was not effective in increasing the purchasing behaviors of customers visiting these participating restaurants. These findings are consistent with previous research by Fitzgerald et al. (2004) and Freedman & Connors (2010) those were conducted to examine customers' selections of healthier food options .

This intervention study also assessed modifications to menu items reported by the participating Latino family-owned restaurants. The assessment showed that Restaurant #1 made a total of 28 modifications; Restaurant #2 made a total of 18 modifications in their nine menu options. Social validity data from the owner of Restaurant #2 suggested that the Healthy Restaurant Program fit well with their business context. Taken together, these findings suggested that making food related environmental changes may be feasible for family-owned restaurants.

The Healthy Restaurant Intervention study had a number of limitations. First, and most importantly, there were no changes in the purchasing behaviors of customers. It might be contributed to the fact that during the intervention phase, there were no explicit reinforcers for customers' purchasing behaviors. Guided by the principles of behavior analysis, when a behavior is followed immediately with a reinforcing consequence, the future frequency of that behavior is more likely to increase (Cooper et al. 2006). In future Healthy Restaurant Intervention studies, researchers might test the cost-effectiveness of additional consequences (e.g., reduced prices of purchases, redeemable coupons, sampling of healthier food options etc.) in increasing customers' purchasing behavior of healthier food options.

Second, the assessment of modifications of healthier food options relied on self-reports by the participating restaurant owners. The Healthy Restaurant Intervention study could not perform quantitative measurements of ingredients and calorie counts; none of the participating family-owned restaurants had standardized recipes and there were multiple chefs/cooks working at different times of the day. Hence, it was possible that each time an entrée was made with slightly varied methods and adding differential amounts of ingredients. Also, since the participating restaurants were located in the same geographic area, there was a uniform reluctance of sharing their specific recipes and ingredients due to the competitive nature of the businesses.

This study had a number of strengths. First, it used a Community-Based Participatory Research (CBPR) approach that involved both scientific and community partners (Minkler & Wallerstein, 2008). For example, before the study, members of Nutrition Committee of the LHFA Coalition actively participated in prioritizing criteria for Healthy Restaurant Award eligibility for restaurants. Based upon these eligibility criteria, the members made shared decisions for granting the awards to eligible restaurants. The Healthy Restaurant Intervention study was then conducted with selected awardees, two Latino family-owned restaurants. Active participation and engagement of LHFA Coalition members helped the Health Restaurant Intervention study precisely state inclusion criteria and identify participating restaurants for the study. Further, Latino community members also helped the researcher understand context of the Latino family-owned restaurants. Particularly, they provided input about culturally-based preparations and ingredients used in Latino family-owned restaurants; for example, traditional forms of solid fats (e.g., lard) used in preparations. These kinds of inputs were helpful for the researcher to communicate goals and procedures of the Healthy Restaurant Intervention study

with the participating restaurant owners and determine specific examples of healthier food options that met the guidelines. The LHFA Nutrition Committee members also provided input for graphical design of bigger glass door stickers for the Healthy Restaurant Award program and translating messages on key menu stickers in the Healthy Restaurant Intervention study. Scientific partners (University of Kansas and K-State University) worked together with members of the Latino community and the restaurant owners to design aspects of the award and intervention; e.g., cultural adaptation for the design of the glass door stickers and bilingual messages on the small menu stickers. Participating restaurant owners were engaged in identifying healthier food options on the menu to meet the criteria based on the Dietary Guidelines for Americans, 2010. The nutritionist from the LHFA Coalition helped with assessing whether reported changes constituted a healthier option according to the Dietary Guidelines.

Second, the measurement of the primary dependent variable was a strength of the study. The dependent variable was measured as percentage of healthier food options purchased by the customers. Since each family-owned restaurant use a different name for a similar item, unlike chain restaurants, there was not a ready-made system for designating healthier food options. This required a comprehensive and robust measurement approach. This study developed a way of measuring the percentage of healthier food options that fit the context of family-owned restaurants. Specifically, it was shown to be able to assess all the categories of healthier food options across in the participating family-owned restaurants. Also, framing the dependent variable in this way made it possible to score using permanent products I.e., electronic receipts and corresponding handbills).

Third, the present study differed from other food environment and similar menu modification intervention studies. This study assessed how many changes or modifications were

reported by the restaurant owners in original preparations or servings from their traditional recipes. By assessing this aspect, the researchers helped to document modifications in the food environments in which healthier food options were made available and accessible on their menu.

Fourth, this was one of the few studies in which interventions were implemented with Latino family-owned restaurants in a lower-income neighborhood. Other similar visual prompts studies by Finkelstein et al. (2011) and Tandon et al. (2011) were typically conducted with chain restaurants or fast-food restaurants.

Fifth, the Healthy Restaurant Intervention study tested a very simple approach, a small menu sticker as a visual prompt placed in front of the identified healthier food options on the menus. Placing a visual prompt at the point of decision making rather than at the point of purchase (e.g., near the cashier's counter) was seen as an added strength of the study. By placing a small menu sticker in front of the healthier food option on the menu, the option was noticeable. A small key sticker was also placed near the bottom of the menu explaining the meaning of the symbolic menu sticker.

Finally, social validity data of the appropriateness of the intervention to the context and culture of Latino family-owned restaurants adds to the study by providing information about the acceptability of the Healthy Restaurant Intervention to a restaurant owner. In further evidence of social validity, the menu labeling was observed to still be in place for five months after data collection.

Future research and practice should focus on achieving larger effects with a greater portion of food environments in communities with large proportions of Latinos and other groups experiencing health disparities. To be able to do so, strategies might include implementing more comprehensive interventions that include changing consequences for customers' purchasing

behaviors and restaurant owners' behaviors of making healthier food options available and accessible to their customers. Perhaps, consequence change for customers could be done in a number of ways such as-by discounting total purchase of healthier food options in a visit, providing redeemable coupons for next visit, or reducing prices for the next purchase of healthier food options. Prompting, product sampling and price reductions have shown small increases in purchases of lower-fat items by customers in a supermarket (Paine-Andrews et al. 1996). To encourage restaurant owners' behavior, perhaps a policy change could be enacted by officials to make healthier food options available and accessible on restaurant menus. A monitoring system might be implemented to assess adherence to policy standards for assuring healthier food options. For example, when implemented by public health officials, this could provide data regarding compliance with age-specific dietary recommendations for foods served in public places, with a uniform nutrition labeling system in compliance with FDA regulation, or with calorie information being placed in public view in restaurants (IOM, 2012). Additionally, intervention elements to be further tested include visual prompts on purchases on children's' menus. Perhaps child friendly visual prompts could be used to denote availability of healthier food options on children's' menus.

Despite its limitations, this applied intervention study added to our understanding of how changes in the food environment could be implemented in Latino family-owned restaurants. It also gave us an idea of how to make healthier food options available and accessible by designating them on the restaurant menus. With this and further strengthened approaches, family-owned restaurant businesses could be agents of change in food environments to assure healthier food options in communities experiencing health disparities.

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List of Appendices:

Appendix A: Criteria for Healthy Restaurant Award Eligibility

Appendix B: Criteria for Scoring a Healthier Food Option from the Restaurant Menu

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Appendix D: Social Validity Assessment Questionnaire

Appendix A: Criteria for Healthy Restaurant Award Eligibility

Latino Health for All Coalition Healthy Restaurant Award**Basic Information**

Name of Restaurant: _____

Address: _____

Type of Restaurant: _____

Owner of Restaurant: _____

Telephone Number: _____ E-mail Address: _____

Manager or Other Contact: _____

Telephone Number: _____ E-mail Address: _____

Will the owner or manager serve as primary contact? _____

Restaurant Qualification

Three types of award designations are available: bronze (meeting 6 criteria), silver (meeting 9 criteria), and gold (meeting all 12 criteria). Please indicate which of the following criteria are met in you restaurant.

Criteria	Indicated on the menu	Available upon request
1. Fresh fruit		
2. Fresh vegetables		
3. Local food		
4. Low- / Fat-free dressings		
5. Whole grain products		
6. Modified preparation		
7. Small or Reduced-sized portions		
8. Sauces/gravies/ dressings on the side		
9. Low fat, sugar, or sodium options		
10. Substitutions for fried side dishes		
11. Children's menu with low-fat milk or side substitutes		
12. Low-fat or skim milk		

Appendix B: Criteria for Scoring a Healthier Food Option from the Restaurant Menu

For Latino Family-owned Restaurants: What makes a menu item healthier on your menu?

Criteria established based on the American Dietary Guidelines, 2010.

Following question was asked to Latino family-owned restaurants participated in the Healthy Restaurant Intervention study in an informal interview with the researcher:

Q: Would you please help me identify an existing healthier food option on the menu for which you have made changes/adjustments from the original/traditional preparation or serving?

Category of Criteria	Specific elements
1) Reduced Calories?	<ul style="list-style-type: none"> Replaced meat with fish Substituted chicken for pork or beef Smaller portion size
2) Reduced solid fats (e.g., lard or butter)?	<ul style="list-style-type: none"> Replaced with oils (e.g., olive or sunflower) Replaced with lower fat (e.g., low fat cheese or sour cream)
3) Reduced sugar?	<ul style="list-style-type: none"> Reduced added sugar
4) Reduced refined grains (e.g., flour tortillas, white rice)?	<ul style="list-style-type: none"> Replaced with whole grains (e.g., wheat tortillas, brown rice)
5) Reduced sodium/salt?	<ul style="list-style-type: none"> Reduced added sodium/salt

Appendix C: Scoring Sheet for Assessing Inter-observer Agreement

Observer no:				
Scoring Sheet: Observing Presence of Healthier Food Options				
Look for presence or absence of Healthier Food Options (Please refer to the list of healthier food options)				
Calculations:				
a) Total number of food options on electronic receipts (B) includes: Main Dish + Side dish + soup (excluding water, soda, juice,)				
b) Percentage of Healthier Food Options purchased (E): Total number of healthier food options purchased (D)/ Total number of food options purchased on the electronic receipts (B) *100				
Electronic Receipt Number (A)	Total Number of food options purchased (noted on receipts) (B)	Healthier food option Present? Yes/No? (C)	Total Number of Healthier Food Options purchased (D)	Percentage of Healthier Food Options purchased (E)
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				
16)				
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34)				
35)				

Appendix D: Social Validity Assessment Questionnaire

Responses by one of the Participating Restaurant owners

Questions:	Rating:				
a) How easy was it to identify healthy food options on your restaurant menu?	1 Not At all	2	3	4	5 Very Easy
b) How well did the Healthy Restaurant Program fit your restaurant and the Latino Community it serves?	1 Not At all	2	3	4	5 Very Well
c) How willing are you to recommend the Healthy Restaurant Program to other restaurant owners?	1 Not At all	2	3	4	5 Very Willing
d) Overall, how satisfied are you with the Healthy Restaurant Program?	1 Not At all	2	3	4	5 Very Satisfied
e) Overall comments about the project-	<p>-Easier for people to see some healthier options on the menu.</p> <p>-Stickers helped a lot!</p>				